

WHAT IS CLAIMED IS:

1                   1.       A method for eliciting an immune response in a subject comprising  
2 administering an immunogenically effective amount of a peptide or protein antigen  
3 comprising one or more T cell epitope(s) coordinately with a non-viral vector comprising  
4 a polynucleotide encoding a T cell co-stimulatory molecule.

1                   2.       The method of claim 1, wherein the peptide or protein antigen  
2 comprises a T cell epitope of a tumor antigen or viral antigen.

1                   3.       The method of claim 2, wherein the tumor antigen is selected from  
2 p53, *ras*, *rb*, *mcc*, *apc*, *dcc*; *nfl*; VHL; MEN1, MEN2, MLM, Her-2neu, CEA, PSA;  
3 Muc1, Gp100, tyrosinase, or MART1.

1                   4.       The method of claim 3, wherein the tumor antigen is selected from  
2 a mutant or normal p53 or *ras* protein.

1                   5.       The method of claim 4, wherein the peptide antigen comprises a  
2 sequence of at least nine amino acids spanning a mutation in p53 or *ras*.

1                   6.       A method for eliciting an immune response in a subject comprising  
2 administering an immunogenically effective amount of a protein antigen comprising at  
3 least one T cell epitope coordinately with a non-viral vector comprising a polynucleotide  
4 encoding a T cell co-stimulatory molecule.

1                   7.       The method of claim 2, wherein the viral antigen is selected from a  
2 human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV),  
3 herpes simplex virus (HSV) or human papilloma virus (HPV) antigen.

1                   8.       The method of claim 7, wherein the peptide antigen comprises at  
2 least nine contiguous amino acids of a HPV antigenic protein.

1                   9.       The method of claim 7, wherein the peptide antigen comprises at  
2 least nine contiguous amino acids of a HIV antigenic protein.

1                   10.      The method of claim 7, wherein the peptide antigen comprises at  
2 least nine contiguous amino acids of a HBV or HCV antigenic protein.

1                    11.     The method of claim 1, wherein the co-stimulatory molecule is  
2     selected from B7-1, B7-2, B7-3, B7-H, ICAM1, ICAM2, ICAM3, LFA1, LFA2 or LFA3.

1                    12.     The method of claim 11, wherein the co-stimulatory molecule is  
2     B7-1.

1                    13.     The method of claim 1, wherein the peptide antigen and non-viral  
2     vector encoding one or more T cell co-stimulatory molecules are administered to the  
3     subject simultaneously as a mixture in a pharmaceutically acceptable carrier or diluent.

1                    14.     The method of claim 1, wherein the peptide antigen and non-viral  
2     vector encoding the T cell co-stimulatory molecule are administered separately to the  
3     subject in a sequential vaccination protocol.

1                    15       The method of claim 1, wherein the peptide antigen and non-viral  
2     vector encoding the T cell co-stimulatory molecule are administered to proximal target  
3     sites selected from the same, or closely-adjacent, intradermal, subcutaneous, mucosal or  
4     intratumoral sites.

1                    16.     The method of claim 1, wherein the non-viral vector is selected  
2     from a RNA or DNA vector.

1                    17.     The method of claim 1, wherein the non-viral vector comprises a  
2     naked DNA vector having the polynucleotide encoding the co-stimulatory molecule  
3     operably linked to regulatory elements necessary for expression of the co-stimulatory  
4     molecule in eukaryotic cells.

1                    18.     An immunogenic composition comprising an immunogenically  
2     effective amount of a peptide or protein antigen comprising a T cell epitope, and a non-  
3     viral vector comprising a polynucleotide that encodes a T cell co-stimulatory molecule  
4     operably linked to regulatory elements necessary for expression of the co-stimulatory  
5     molecule in eukaryotic cells, formulated in a pharmaceutically acceptable carrier or  
6     diluent.

1                    19.     The immunogenic composition of claim 18, wherein the peptide  
2     antigen comprises a T cell epitope of a tumor antigen or viral antigen.

1                   20.     The immunogenic composition of claim 19, wherein the tumor  
2     antigen is selected from p53, *ras*, *rb*, *mcc*, *apc*, *dcc*; *nfl*; VHL; MEN1, MEN2, MLM,  
3     Her-2neu, CEA, PSA; Muc1, Gp100, tyrosinase, or MART1.

1                   21.     The immunogenic composition of claim 20, wherein the peptide  
2     antigen comprises a sequence of at least nine amino acids spanning a mutation in p53 or  
3     *ras*.

1                   22.     The immunogenic composition of claim 18, wherein a protein  
2     antigen is administered as a purified protein or a tumor lysate component of a vaccine  
3     formulation.

1                   23.     The immunogenic composition of claim 19, wherein the viral  
2     antigen is selected from an antigenic protein of human immunodeficiency virus (HIV),  
3     hepatitis B virus (HBV), hepatitis C virus (HCV); herpes simplex virus (HSV), or human  
4     papilloma virus (HPV) antigen.

1                   24.     The immunogenic composition of claim 23, wherein the peptide  
2     antigen comprises at least nine contiguous amino acids of a HPV E6 or E7 protein.

1                   25.     The immunogenic composition of claim 23, wherein the peptide  
2     antigen comprises at least nine contiguous amino acids of a HIV antigenic protein.

1                   26.     The immunogenic composition of claim 23, wherein the peptide  
2     antigen comprises at least nine contiguous amino acids of a HBV antigenic protein.

1                   27.     The immunogenic composition of claim 18, wherein the co-  
2     stimulatory molecule is selected from B7-1, B7-2, B7-3, B7-H, ICAM1, ICAM2, ICAM3,  
3     LFA1, LFA2 or LFA3.

1                   28.     The immunogenic composition of claim 27, wherein the co-  
2     stimulatory molecule is B7-1.

1                   29.     The immunogenic composition of claim 18, wherein the non-viral  
2     vector is selected from a RNA or DNA vector.

1                    30.     The immunogenic composition of claim 29, wherein the non-viral  
2     vector comprises a naked DNA vector having the polynucleotide encoding the co-  
3     stimulatory molecule operably linked to regulatory elements necessary for expression of  
4     the co-stimulatory molecule in eukaryotic cells.

1                    31.     The immunogenic composition of claim 18, wherein the peptide  
2     antigen comprises a cytotoxic T cell (CTL) epitope.